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THE IMPACT OF IFRS 16 ON A RENEWABLE ENERGY PORTUGUESE COMPANY

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Abstract

Before 2016, lease accounting was regulated by IAS 17, which did not require operational leases to be included in the balance sheet. With the issue of IFRS 16, all leases are expected to be accounted on the balance sheet. This project assesses the potential impact derived from this change, focusing on an ex ante approach of a case study from a Portuguese company present in the Renewable Energy sector. The results show an impact on the financial position of the company which corroborate previous researches and further emphasize the need for companies to prepare as to minimize IFRS 16 impact.

Keywords: Operating Leases; Accounting standards; IFRS 16; Impact Assessment

1. Introduction

The world economy relies on cross-border transactions and free flow of international capital. In fact, more than one third of all financial transactions occur across borders and this number is expected to grow.[1] Therefore, there is a need for harmonizing international accounting standards not only so that investors diversify and look for investment opportunities across the world, but also to enable companies to raise capital, undertake transactions, have international operations and subsidiaries in multiple countries. The International Financial Reporting Standards (IFRS) address this issue by providing a high quality, internationally recognized, set of accounting standards that lead to transparency, accountability and efficiency in financial markets around the world[1]; thus, enhancing reporting quality and improving comparability of financial statements across countries (Wang C., 2014)[2.]

Despite the increase in reporting quality and cross border companies' comparability, the adoption of IFRS also imposes several costs on firms. Whether they represent costs associated with internal staff time, external consultancy, audit support, and systems costs; or transitional and ongoing costs, companies have to bear them as they shift from the domestic standards to IFRS.[3]

The International Accounting Standards Board (IASB) continues to make several changes to IFRS as part of joint projects with other standard setters entities, such as the US national standards setter - FASB -, as they pursue high-quality accounting standards that increase comparability and tackle inconsistencies and weaknesses of existing standards. The impact of these changes is not restricted to companies that use IFRS. It also affects other key stakeholders such as investors, auditing and accounting firms, banks and even the financial market itself. As so, the study of these standards and their impact on firms is meaningful not only for academic purposes but also for practical purposes, as they highly affect companies and users of financial statements.

This project analyses how the adoption of IFRS can affect a company and its financial statements. Based on a case-study from a Portuguese company present in the Renewable Energy sector, this project aims to study, clarify and measure the impact of the recent changes to the accounting standard related with Leases, from IAS 17 - *Leases* to a more faithful representative of these transactions, IFRS 16 - *Leases*. This study focuses on the latter one.

Previous research has addressed several aspects of IFRS 16 by studying the implications of including operating leases on the balance sheet: when using operating leases, companies depict a more favorable image of both the company's performance and riskiness (Imhoff, Lipe and Wright, 1991[4] and 1997[5]); capitalizing leased assets alters both the cardinal measures and ordinal rankings of firms by the common risk and performance metrics (Cornaggia et al, 2013[6]); and the new standard would affect not only the presentation of items in the balance sheet and static measures such as gearing, but also the "real" performance of the company (ROA) and the return for shareholders (ROE) (M. Ángels Fitó et al, 2013[7]).

Although these studies contribute to the understanding of the impact of leases capitalization, they are based on the financial statements and related notes published and available for the sample of companies the authors chose. Consequently, since a significant amount of lease related information was not available on the financial statements nor in its notes, several assumptions were made regarding discount rate, total lease life and future lease payments, which can be too broad. The current study complements the previous literature by using an in-depth and lease-by-lease approach when studying the impact of including operating leases on the balance sheet. Hence, it uses primary data obtained directly from the company's accounting department regarding discount rates, expected lease contract life/duration properly supported and previous and future lease related payments.

On one hand, it is expected that the company's level of leverage will increase as will the total assets, due to the inclusion of the unrecorded right-of-use (ROU) asset and the unrecorded lease liability on the balance sheet. On the other hand, since the lease expense from IAS 17 will be divided into depreciation expense and interest, EBIT is likely to increase and net income is predicted to decrease. Additionally, these changes are likely to affect financial ratios relying on these balance sheet and income statement items (namely, ROA, ROE, Debt-to-Capital and EPS).

The remainder of the project is as follows: section two includes the review of the previous researches on the topic as well as the state of current lease accounting and main changes incorporated with IFRS 16. Section three explains the research method, the research process and the measures used in this project. Section four describes findings and finally the discussion and conclusion are provided on section five.

2. Background Literature

As an ex-ante approach to the impact new IFRS standards have on firms, this study focuses on trying to predict and measure the effect of a change in financial standards. Several other authors have been using this ex-ante approach to study changes to IFRS standards, namely changes related with Lease accounting.

Long before the issue of IFRS 16 - *Leases* by IASB, a paper that studied the balance sheet effect (Imhoff, Lipe and Wright, 1991)[4] of including operational leases on the balance sheet concluded that leverage ratios would be significantly increased by capitalizing leases. Other performance ratios would also be affected but not so significantly. The paper focuses only on the balance sheet effect and assumes that the income statement effects of lease capitalization are negligible, which limits the scope of analysis and its conclusions. On a later study (Imhoff, Lipe and Wright, 1997)[5] addressing the income effect, Imhoff et al complemented the previous research by adding that under operating leases a company would report higher operating and net income, with lower total assets and lower total liabilities. Leading, therefore, to a more favorable portrayal of both the firm's performance and its riskiness.

These studies stood as a reference for the elaboration of further studies related with lease accounting. However, since not all information was disclosed at the time, several assumptions regarding discount rates (e.g. Imhoff et al, (1991)[4] used a 10% discount rate for all the sample), future lease payments and total lease life were made (e.g. Imhoff et al, (1991)[4] assumed that the proportion between the remaining life and the total life of a leased asset was 50%). Furthermore, the authors used the constructive capitalization model, developed by Imhoff et al, which is based on some general assumptions: (a) at the inception of the lease, the book value of the leased asset is equal to the value of the lease liability; (b) the capitalized asset and the capitalized liability both equal zero at the end of the lease; (c) straight-line depreciation is used for all assets; (c) lease payments are constant over the lease terms.

The majority of these studies got to the same conclusions: including leases on the balance sheet has a major effect on the balance sheet and income statement, consequently affecting performance and risk measures. These authors also used a set of assumptions (even if with different values), therefore, it is important to note that the results found are relevant but may not truthfully depict the impact they try to estimate.

One of these studies, focusing on the inclusion of leased assets on the balance sheet (Cornaggia et al, 2013)[6], found that capitalizing leased assets alters both the cardinal measures and ordinal rankings of firms by the common risk and performance metrics. By studying US corporations' use of operating leases between 1980 and 2007, and using a firm-specific discount rate in contrast with Imhoff et al (1991)[4] 10% discount rate, the authors found that if leased assets were recognized on the balance sheet over their 27-year sample period, the average debt-to-capital ratios would increase 15-29% and average levered equity betas increase by 18-33%. Furthermore, they concluded that measures of risk and performance used nowadays understate the risk or overstate the performance of firms relying most heavily on off-balance sheet leasing. This study calculates the lease liability as the present value of non-cancellable minimum lease payments, ignoring commitments after the 5th year of the lease contract, which can be considered a limitation. However, the authors acknowledge this fact and state a preference for a more conservative measure. On the same year, a study by M. Ángels Fitó, Soledad Moya e Neus Orgaz[7] considered the effect of operating lease capitalization on key financial ratios of quoted Spanish companies. Complementing the previous mentioned study, when calculating the lease liability, these authors considered all the future lease related payment (by assuming that after year 5 the lease payments are equal to the lease payment of year 5). The study found relevant changes for leverage and performance ratios. According to them, the new standard would affect not only the presentation of items in the balance sheet and static measures such as gearing, but also the "real" performance of the company (ROA) and the return for shareholders (ROE). As Imhoff et al (1991[4] and 1997[5]), the authors used the constructive capitalization model and included assumptions regarding discount rate (adjusted to include the default spread and the risk free rate represented by the 10-year Spanish bond) and total lease life. However, the paper gives us a more robust set of findings as it includes a scenario analysis.

Another paper from 2014[8], published by the journal "Accounting in Europe", focused on the review of recent literature regarding lease accounting by analyzing published papers related to ex-ante impact analysis of IFRS 16. The bulk of the literature that forms the review, highlighted that the proposed changes to lease accounting would have significant implications for both preparers and users of financial reports. Goodacre (2003) and Duke et al (2009) concluded in their studies that companies can minimize the impact on firm's ratios, income, and earnings by reporting leases as operating or replacing long rentals with short and more flexible ones. In 2010, Singh added that firms who plan proactively in assessing the impact of the new lease accounting, can minimize the added administrative and financial costs of compliance. Even if using different measures, assumptions and industries, the literature reviewed in this paper presents the same conclusion of the previous mentioned studies: leverage will significantly increase while liquidity and profitability are expected to decrease (Bennett and Bradbury, 2003); EBITDA (Mulford and Gram, 2007) and EBIT (Bryan et al, 2010) will increase, and ROA and ROE will decrease significantly; potential negative effects for firms regarding access to financing and meeting debt covenants (Grossmann and Grossmann, 2010).

Leases Accounting

Previous accounting standards related to leases are based on an ownership model, and separated them in finance lease and operating lease (off-balance sheet lease). More specifically, IAS 17 states that the classification of leases is based on the extent to which risks and rewards incidental to the ownership of a leased asset lie with the lessor or the lessee.

Operational leases have long been seen as an alternative to traditional financing options, since they are not reflected directly on the balance sheet and hence, do not affect financial ratios. As a result, companies structure their lease contract to avoid recognizing them as finance leases. In fact, a study regarding US companies' use of off-balance sheet leases, concluded that from 1980 to 2007, the use of this type of financing increased 745% as a proportion of total debt.[6] By avoiding the recognition of their leases on the balance sheet, managers improve their firm's reported performance and leverage ratios.[4] This lack of information about some leases on the balance sheet, means that investors and analysts do not have the complete picture of the financial position of a company, which makes it harder to compare firms that borrow to buy assets with those that lease assets.

Until January 2016, accounting for leases was regulated by the IAS 17, effective since 1st of January 1999, but the sentiment that operating leases should be included in the balance sheet gained favor with users and standard setters. As a result, on January 2016, the IASB issued IFRS 16 - *Leases*, that, by setting out a model on how to identify a lease arrangement and its accounting treatment for both lessees and lessors, establishes that all leases should be recognized on the balance sheet (except “low-value assets”, for example a lease of a personal computer and short-term leases, i.e. lease of 12 months or less).

According to IFRS 16, a lease is “a contract that conveys to the customer (“lessee”) the right to use an asset for a period of time in exchange for consideration”. The assessment of whether a contract includes a lease is based on the fact that the customer has the right to control the use of an identified asset for a period of time.[9]

The new standard requires that lessees apply a single accounting model for all leases, hence they must recognize, at the commencement date of a lease:

1. A right-of-use (ROU) asset, for the right to use the underlying asset for the lease term (which compromises the amount of initial measurement of the lease liability, any lease payments made at or before the commencement date, lease any lease incentive received, any initial direct cost incurred by the lessee, and an estimate of costs to be incurred by the lessee in dismantling the underlying asset, restoring the sit, or the underlying asset to the conditions required by the terms and conditions of the lease);
2. A lease liability, representing the obligation to make the lease payments (which include all the future payments discounted at an implicit discount rate).[10]

As IAS 17 and IFRS 16 differ on the lease accounting record, lessees will also need to make an equity adjustment to accommodate the shift in the accounting treatment.

Finally, lessee companies facing IFRS 16 will need to choose to apply the standard retrospectively, or using a modified retrospective approach. Under the full retrospective approach the lessee needs to: restate its prior financial information; recognize an adjustment in equity at the beginning of the earliest period presented (2018). Under the modified retrospective approach the lessee applies the standard from the beginning of the current period (2019), does not restate its prior-year financial information, and recognizes an adjustment only in equity at the beginning of the current period (2019).

The full retrospective approach requires a company to have access to extensive information about its leasing transactions in order to apply the standard. This includes not only historical information about lease payments and discount rates, but also historical information that management would have used in order to make the various judgements and estimates needed to apply the lessee accounting model.

The lessor accounting treatment is substantially unchanged when compared to previous leases standard IAS 17, although there are new disclosure requirements. Therefore, it is expected that the new accounting standard for leases will have a greater impact for lessees. The new standard will not only affect performance indicators (such as EBITDA), cash-flows and total assets, but also have its impact on debt covenants and KPIs[11].

A summary of the differences between IAS 17 and IFRS 16 can be depicted as follows:[9]

Table 1 - Summary of the balance sheet Impact of IFRS 16

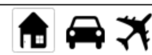
	IAS 17		IFRS 16
	Finance Leases	Operating Leases	All Leases
Assets		-----------	
Liabilities	€€€€€€	-----------	€€€€€€
Off-balance sheet rights/obligations	-----------	 €€€€€€	-----------

Table 2 - Summary of the income statement Impact of IFRS 16

	IAS 17		IFRS 16
	Finance Leases	Operating Leases	All Leases
Revenue	€€€€€€	€€€€€€	€€€€€€
Operating costs (excluding depreciation and amortisation)	-----------	Single lease expense	-----------
EBITDA		-----------	↑↑
Depreciation and amortisation	Depreciation	-----------	Depreciation
Operating profit			↑
Finance cost	Interest		Interest
Profit before tax			↔

3. Research Methods

This project is based on a real case study from X Group, a corporation headquartered in Portugal. It specializes in the operation and maintenance of wind farms, allowing the country to produce clean and renewable energy. The company asked an audit and accounting firm in Portugal (Y Company) to quantify the impact the new standard would have on the its financial statements. X Group fits as a candidate to measure the effect of IFRS 16 because it relies on off-balance sheet financing through operating leases. More specifically, it leases the land where its wind turbines are installed. Currently, the Group is composed by 19 companies, and has 31 wind farms spread through the country. As of 2016, it had an annual Rent and Lease expense amounting to 1.912.953 € recorded on its financial statements.

To study the IFRS impact in this firm it was necessary to identify the sample of contracts to be studied. A team from Y Company analyzed 125 lease contracts from all the 19 companies, which represent the full amount of lease contracts related with the land where its wind turbines are installed, to estimate the effect of the new standard.

Research Process

The study of the IFRS 16 effect followed a three step model: Diagnosis, Analysis and Impact Measurement. The first section, the Diagnosis, included the situation analysis, the identification of the problem, and the discussion with X Group of the contracts to be analyzed. Afterwards, in the Analysis part, the Content Analysis methodology was used to study the content of the lease contracts. Since the new standard is based on the calculation of a ROU asset and a lease liability, it implied that a significant amount of lease specific information needed to be collected. Therefore, the analysis of the lease contract was crucial as it allowed to extract most of the information needed to do the estimates of the lease-related asset and liability. Finally, on the third part of the research, an Impact Analysis was conducted, using the primary data from the lease contracts collected during the previous research step, to measure the effect of the new standard on the company's financial statements and key performance and risk measures. A measurement model was created on Excel (see **Appendix 1** for an example) as to include all the lease-related variables needed to estimate both the ROU asset and the lease liability under IFRS 16 and the lease expense under IAS 17. The following variables were collected from X Group and computed into the model:

Table 4 - Lease Specific Variables

Model Input Variables	
Rents (fixed and variable)	Beginning of the lease term
Payments in advance	End of the lease term
Deferred Costs	Expected duration of the lease
Initial Direct Costs	Discount rate
Dismantling Costs	Coefficient of rent update (e.g. inflation)

Additionally, to conclude on the impact the following assumptions were made:

Discount Rate: In order to compute the correct and most appropriate discount rate, Y Company asked X Group to provide either the rate implicit in the lease (the minimum return the lessor expects to earn on the lease - which typically is not disclosed and needs to be collected directly from the lessor) if the company chose to apply the full retrospective transition approach; or the company's incremental borrowing rate (the rate the lessee would expect to borrow at over a similar term and with a similar security on the ROU asset), if it chose the modified approach. The company opted for the modified approach, as it is less costly.

Tax Rate: Since this study does not aim to study the tax effect of the new standard, it was assumed that the tax rate was the same as the one from 2016 fiscal year, which was obtained by dividing the tax expense by the earnings before taxes.

Expected Duration of the lease: To avoid unrealistic assumptions regarding the lease expected duration, Y Company asked X Group to provide the best estimation of the duration of each lease contract. These estimate were performed internally on a lease-by-lease approach by X Group.

These assumptions needed to be properly supported since the external audit team of the company could question them.

Afterwards, the lease related expense under IAS 17 and IFRS 16 was calculated and the difference between the accounting record under IAS 17 and IFRS 16, for each contract, was estimated. The first one was the basis for the forecast of the income statement impact (which only exists on the Full Retrospective Approach); and the latter one was used to conclude on the balance sheet effect of the new accounting standard. Both the calculations were performed through the Excel model previously mentioned. To simplify, the income statement effect was calculated as of 31-12-2017, and the balance sheet effect as off 01-01-2018 (the date on which the company would need to make the equity adjustment had it chosen the Full Retrospective transition approach).

Finally, the measurements were based on the 2016 financial statements, since the financial statements of the 2017 fiscal year were not yet available. However, it does not affect the results considering this is an impact measurement, which focuses on the variation of key items and financial ratios.

Measures

Table 1 and 2 depict how IFRS 16 will affect both the balance sheet and the income statement. Total assets and Total liabilities will increase, due to the recognition of the ROU asset and the of the lease liability. The income statement will also be affected since the operating lease expense will disappear and all operational leases will be depreciated and generate interest expense, just as finance leases. Thus, EBITDA, EBIT and depreciation and amortization and finance costs are likely to increase, while EBT is likely to remain unchanged.

Therefore, in order to measure the impact of the new standard, the project employs key performance and risk metrics typically used by financial statement users to evaluate a company, focusing on those that rely on the changed balance sheet and income statement items. Having said that, the measurements used for the impact analysis were:

- *Debt to Capital*: by using both the Total liabilities and Total Capital, this ratio is a measurement of a company's financial leverage[12]; this ratio is relevant to measure the changes on the company's financial leverage position due to the increase of the lease liability. (=Total liabilities/(Total liabilities + Total Shareholder's Equity)
- *Return on assets (ROA):* by using EBIT and Total assets, the ROA ratio is an indicator of how profitable a company is relative to its total assets[13]; this ratio is suitable to measure the increase of total assets due to the capitalization of operating leases. (=EBIT/Total assets)
- *Return on equity (ROE):* by using Net Income and Total Equity, this ratio depicts how much profit a company generates with the money shareholders have invested[14]; since IFRS 16 is expected to reduce total equity, this ratio allows to measure this effect. (=Net Income/Total Equity)

4. Findings

In order to provide a first general assessment of the impact of IFRS on financial statements, the balance sheet and income statement, with lease related expense from 2017, are presented according to IAS 17 and IFRS 16:

Table 5 - Income statement effect

Income Statement as of 31-12-2017

	IAS 17	**IFRS 16**	**Income Statement Impact**
Sales	177.055.451,00 €	177.055.451,00 €	- €
Other operating income	1.530.298,00 €	1.530.298,00 €	- €
Total operating income	178.585.749,00 €	178.585.749,00 €	- €
External supplies and services	(23.916.220,00) €	(22.031.017,02) €	1.885.202,98 €
Employee costs	(2.853.621,00) €	(2.853.621,00) €	- €
Depreciations and impairment of fixed assets	(34.289.671,00) €	(35.517.938,73) €	(1.228.267,73) €
Provisions	- €	- €	- €
Other operating expenses	(6.462.334,00) €	(6.462.334,00) €	- €
Total operating expenses	(67.521.846,00) €	(66.864.910,74) €	656.935,26 €
Operating results	**111.063.903,00 €**	**111.720.838,26 €**	**656.935,26 €**
Financial income	146.125,00 €	146.125,00 €	- €
Financial costs	(53.897.296,00) €	(54.832.381,15) €	(935.085,15) €
Results before tax	**57.312.732,00 €**	**57.034.582,11 €**	**(278.149,89) €**
Income tax	14.435.830,00 €	14.365.770,09 €	(70.059,91) €
Net income for the year	**42.876.902,00 €**	**42.668.812,01 €**	**(208.089,99) €**
Fair value reserve - hedging derivatives	11.618.000,00 €	11.618.000,00 €	- €
Associated tax impact	(2.875.455,00) €	(2.875.455,00) €	- €
Other comprehensive income items	8.742.545,00 €	8.742.545,00 €	- €
Comprehensive income for the year	**51.619.447,00 €**	**51.411.357,01 €**	**(208.089,99) €**
Earnings per share	824,18 €	820,86 €	(3,32) €

This table shows the values corresponding to the impact the new standard could have on the income statement only if the company chose the Full Retrospective transition approach. As one can see, total operating expenses will be reduced by the amount previously recognized as a lease expense under IAS 17, and will, at the same time, be accreted to include the depreciation expense related with the ROU asset characteristic of IFRS 16. Having said that, the total impact on operating income (EBIT) will be € 656.935,26 (+0,59%). As previously stated, under IFRS 16 companies need also to recognize an interest expense related with the lease. Therefore, considering this amount totals € 935.085,15, the impact on results before tax (EBT) is € - 278.149,89 (-0,49%).

Additionally, the earnings per share (EPS) were computed: the EPS decreased from € 824,18 to € 820,86, a reduction of € 3,32 (-0,40%) in the price of each share.

Table 6 - Balance sheet effect

Balance Sheet effect as of 01-01-2018			
	IAS 17	**IFRS 16**	**Balance Sheet impact**
ASSETS			
Non-current assets			
Tangible fixed assets	639.708.820,00 €	639.708.820,00 €	- €
Intangible Assets	17.343.858,00 €	36.243.276,73 €	18.899.418,73 €
Goodwill	206.232.523,00 €	206.232.523,00 €	- €
Deferred tax assets	30.927.130,00 €	30.927.130,00 €	- €
	894.212.331,00 €	913.111.749,73 €	18.899.418,73 €
Current Assets			
Trade debtors	14.912.141,00 €	14.912.141,00 €	- €
State and other public entitites	127.846,00 €	127.846,00 €	- €
Receivables and other assets	17.646.806,00 €	17.646.806,00 €	- €
Cash and cash equivalents	18.176.091,00 €	18.176.091,00 €	- €
	50.862.884,00 €	50.862.884,00 €	- €
Total Assets	**945.075.215,00 €**	**963.974.633,73 €**	**18.899.418,73 €**
EQUITY AND LIABILITIES			
Capital and reserves			
Share capital	50.000,00 €	50.000,00 €	- €
Acessory capital contributions	24.057.250,00 €	24.057.250,00 €	- €
Fair value reserves and others	(84.250.075,00) €	(84.250.075,00) €	- €
Accumulated losses	(8.272.635,00) €	(11.395.781,79) €	(3.123.146,79) €
Net income for the year/period	41.209.196,00 €	40.931.046,11 €	(278.149,89) €
	(27.206.264,00) €	(30.607.560,68) €	(3.401.296,68) €
Non controlling interests	10.818.906,00 €	10.818.906,00 €	- €
Total Equity	**(16.387.358,00) €**	**(19.788.654,68) €**	**(3.401.296,68) €**
LIABILITIES			
Non current liabilities			
Provisions	1.854.772,00 €	1.854.772,00 €	- €
Bank loans and overdrafts	6.722.104,00 €	6.722.104,00 €	- €
Other financial instruments	539.936.418,00 €	539.936.418,00 €	- €
Payables and other liabilities	145.139.104,00 €	145.139.104,00 €	- €
Lease Liability	- €	22.300.715,41 €	22.300.715,41 €
Deferred tax liabilities	68.155.399,00 €	68.155.399,00 €	- €
	761.807.797,00 €	784.108.512,41 €	22.300.715,41 €
Current liabilities			
Trade Creditors	2.016.104,00 €	2.016.104,00 €	- €
Bank loans and overdrafts	10.885.053,00 €	10.885.053,00 €	- €
Other financial instruments	57.730.739,00 €	57.730.739,00 €	- €
State and other public entitites	9.069.541,00 €	9.069.541,00 €	- €
Payables and other liabilities	119.953.339,00 €	119.953.339,00 €	- €
	199.654.776,00 €	199.654.776,00 €	- €
Total Liabilities	**961.462.573,00 €**	**983.763.288,41 €**	**22.300.715,41 €**
Total Equity and Liabilities	**945.075.215,00 €**	**963.974.633,73 €**	**18.899.418,73 €**

In the previous table, the balance sheet on 01-01-2018 under IAS 17 and IFRS 16 are compared if the Full Retrospective transition approach was chosen. The only difference when computing the same effect under the Modified Retrospective approach would have been that the only adjustment needed was an equity adjustment amounting to € 3.401.297, since there is no impact on the income statement under this approach. However, the final impact on the balance sheet is the same.

The ROU asset computed through the model under IFRS 16 was € 18.899.418,73. This amount was accreted to the Intangible Assets (2,00% increase in total assets), and represents the right-of-use at that date would the IFRS 16 always been applied, i.e. it includes the original ROU minus the depreciation amounts calculated on a straight-line basis. The lease liability forecasted was € 22.300.715,41, and is accreted to the liabilities (2,32% increase in total liabilities). This amount includes the present value of the future lease rents, discounted at the proper rate provided by X Group and amortized by the lease rents already paid. Lastly, an equity adjustment is needed to accommodate the difference between IAS 17 and IFRS 16. This adjustment is divided into two: an adjustment in net income for the year amounting to the net income effect forecasted on Table 5, € 278.150; and an adjustment in accumulated losses amounting to € 3.123.147.

Finally, using the impacts on the previous financial statements the impact on the financial ratios can now be estimated. The following table summarizes these impacts:

Table 7 – Financial Ratios effect

Ratio Impact - Full Retrospective Transition Approach

	IAS 17	IFRS 16	Ratio Impact	% Variation
Debt to Capital	1,029	1,032	0,003	0,29%
Return on Assets (ROA)	11,75%	11,59%	-0,16%	-1,38%
Return on Equity (ROE)	-2,62	-2,16	0,46	-17,59%

Ratio Impact - Modified Retrospective Transition Approach

	IAS17	IFRS 16	Ratio Impact	% Variation
Debt to Capital	1,029	1,032	0,003	0,29%
Return on Assets (ROA)	11,75%	11,52%	-0,23%	-1,96%
Return on Equity (ROE)	-2,62	-2,17	0,45	-17,19%

Whether the company chooses the Modified or the Full Retrospective approach, the impact on the ratios will be substantially the same. Using the estimates provided by the model the Debt to Capital ratio is expected to increase (+0,29% increase), and the ROA (-1,38% or -1,96%) and ROE (-17,59% or -17,19%) are forecasted to decrease. The most relevant impact will be on ROA and ROE, as a result of the recognition of the ROU asset and lease liability which increase total assets and total liabilities and, therefore, decrease total equity. The ROE reduction is further intensified by the decrease on net income, due to the recognizing of a depreciation and interest expense under IFRS 16.

The findings corroborate previous researches on the topic: operating results, total assets and total liabilities are expected to increase as will the Debt-to-Capital ratio, while ROA and ROE are forecasted to decrease. However, since the current project is based on a case study from a specific company and depends on its lease contracts, it may not depict an impact as great as other previous studies that used considerable larger samples.

Differently from the current study, previous researches used the constructive capitalization method, developed by Imhoff et al (1991[4] and 1997[5]). This method has a set of assumptions that may be too broad and affect the impact measurement. Additionally, some of these authors used a discount rate chosen by themselves: Imhoff et al (1991[4] and 1997[5]) used a 10% discount rate and M. Ángels Fitó et al (2013)[7] used a discount rate obtain from its financial statements (interest expense/EBIT), but included a default spread and the risk free rate corresponding to the 10-year Spanish bond. The discount rate greatly affects the estimation of the impacts as it is used to calculate the present value of the lease liability and ROU asset. The current study, in contrast with the previously mentioned, used discount rates provided by X Group that averaged 4,979% and varied from 3,920%, in 2011, to 8,631%, in 2013. By using these firm specific discount rates, the current project tackles one of the limitations of previous researches on the topic, but this may result in the impacts found to not be as great as other previous studies.

5. Discussion and Conclusions

The main purpose of this project was to forecast the impact the change on accounting standards, from IAS 17 to IFRS 16, would have on a Portuguese company from the Renewable Energy sector. It represents a contribution to previous researches on the topic since it is an in-depth and lease-by-lease approach to the impact measurement, when compared to other studies focusing on the annual reports of companies.

Regarding the balance sheet and income statement analysis, the previous estimated impacts go hand-in-hand to what Table 1 and 2 summarize: operating results, total assets and total liabilities are expected to increase. These results also corroborate previous researches' findings: Imhoff et al, in 1997[5], concluded that under operating leases companies report higher operating and net income, with lower total assets and total liabilities; later, Mulford and Gram, in 2007, and Bryan et al, in 2010, found that EBITDA and EBIT, respectively, would be increase by the capitalization of operating leases.[8]

Concerning the financial ratios analysis, the impacts presented on Table 7 – increase in Debt-to-Capital and decrease in ROA and ROE – also strengthen previous studies: Imhoff et al, in 1991[4], Bennett and Bradbury, in 2003[8], and Cornaggia et al (Debt-to-Capital), in 2013[6], stated that leverage ratios would be significantly increase; Mulford and Gram, in 2007[8], Bryan et al, in 2010[8] and M. Ángels Fitó et al, in 2013[7], found that ROA and ROE would be fairly reduced by the capitalization of operating leases.

It not only corroborates previous researches' theoretical findings but it also has some practical implications. The new standard implies that a significant amount of lease related information is readily available so companies can account for them according to IFRS 16. The problem is, most companies do not have information about leases stored in a practical and ready-to-use manner. Some of them, the ones that do not relies heavily on operating leases, do not even have an accounting process implemented that enables them to manage their lease portfolio. The practical implication of this is that companies will face a hard time trying to compile all the data needed to comply with the new standard, which can be time and resource consuming. There is a need to plan ahead and not only adapt the accounting processes related with leases but also to structure new lease contracts in a way that minimizes the effect derived from them. Therefore, it may implicate new negotiation process with lessors to modify contracts, so that the accounting treatment derived from them benefits both the lessee and the lessor.

Despite the cost that companies will have to bear when shifting to the new standard, IFRS 16 greatly benefits users of financial information and investors throughout the world. Under IFRS 16, companies will present financial information that depicts their financial position more truthfully, which diminishes the information asymmetry and enables investors and other users of financial information to make more conscious decisions.

Although it confirms and complements previous findings of previous related researches, this study represents an ex-ante approach and only an estimation of the potential impact on the financial statements of a company. It also is a case-study approach which limits the scope where this findings can be applied, and it is not typically easy to generalize single context findings like the one presented to other contexts.

It is important to highlight that, since the new standard relies heavily on how the lease contract is structured, the effects will vary significantly from company to company depending on its use of off-balance sheet leases, and on the structure of its lease contracts. Since the current project is based only on one company the impacts expected to occur might not have the dimension that other researchers forecasted for a bigger sample of companies. The model is based on the lease contracts of X Group and the impact might be smaller for this specific firm.

This study indicates that IFRS 16 is likely to have an impact on this specific company and one might extrapolate the same is reasonably possible to happen for other companies relying on operating leases.

With one year left until the official date of transition, companies' management must bear in mind all the transition cost implied by IFRS 16. Companies should study how to accommodate this shift in accounting standards and how they can structure new lease contracts as to minimize the potential impact. As Singh added in 2010[8], firms that plan proactively in assessing the impact of the new lease accounting can minimize the added administrative and financial costs of compliance.

The current research was limited to the financial impact of IFRS 16 (balance sheet and income statement effect and ratio analysis). Since there is also a significant impact on the companies' operations and accounting processes, there is still avenues for further research. Future work might examine how the company can prepare and structure their lease related process as to minimize the transition costs. This can include not only how to store lease related data in an efficient and practical manner but also to come up with different solutions to structure new lease contract as to avoid unnecessary costs.

Appendix 1

As of 01-01-2018	
ROU	34.879,84
Lease Liability	-47.023,42
Equity Adjustment	12.143,59

Contract information	
Date of beginning	2006
End date	2030
Duration	24
Future rents period	24

Description	Contract value / Annual	Contract value / Total
Initial costs		0
Advance payments		0
Dismantling costs		0
Initial period rent		
Fixed rent	4.927	118.246
Variable rent	0	0

DASHBOARD	
ROU	69.760
Future rents	*69.760*
Advance payments	*0*
Initial costs	*0*
Dismantling costs	*0*
Depreciation	-69.760
Annual (Average)	*-2.907*
Interest	48.486
Liability	69.760
Provision	0

Resume	Information
Future rents	118.246
Discount rate	4,737%
Rent update coefficient	0,000
Production rate	
Duration	24
Initial / Deffered costs	0
Other costs (dismantling)	0
Total Value	118.246

Impacts & Differences IAS17 & IFRS16 - Future rents

	Initial	1999 to 2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Cash payments	0	0	4.123	4.251	4.357	4.479	4.479	4.493	4.669	4.826	4.873	4.858	4.866	4.892	4.946	5.001	5.056	5.111	5.167	5.224	5.282	5.340	5.399	5.458	5.518	5.579	0
Advance payments	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Initital costs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IAS 17 Operating lease expense	**0**	**0**	**4.123**	**4.251**	**4.357**	**4.479**	**4.479**	**4.493**	**4.669**	**4.826**	**4.873**	**4.858**	**4.866**	**4.892**	**4.946**	**5.001**	**5.056**	**5.111**	**5.167**	**5.224**	**5.282**	**5.340**	**5.399**	**5.458**	**5.518**	**5.579**	**0**
Rents	0	0	4.123	4.251	4.357	4.479	4.479	4.493	4.669	4.826	4.873	4.858	4.866	4.892	4.946	5.001	5.056	5.111	5.167	5.224	5.282	5.340	5.399	5.458	5.518	5.579	0
Advance payments																											
Deferred costs																											
Initial costs																											
IFRS 16 lease depreciation & interest		**0**	**7.030**	**5.535**	**5.565**	**5.606**	**5.522**	**5.447**	**5.530**	**5.590**	**5.537**	**5.415**	**5.312**	**5.222**	**5.153**	**5.080**	**5.001**	**4.916**	**4.826**	**4.729**	**4.625**	**4.514**	**4.396**	**4.270**	**4.136**	**3.994**	**-4.704**
Amortisation expense	69.760	0	2.907	2.907	2.907	2.907	2.907	2.907	2.907	2.907	2.907	2.907	2.907	2.907	2.907	2.907	2.907	2.907	2.907	2.907	2.907	2.907	2.907	2.907	2.907	2.907	0
Interest expense	48.486	0	4.123	2.628	2.658	2.699	2.615	2.540	2.624	2.684	2.630	2.509	2.405	2.315	2.247	2.173	2.094	2.010	1.919	1.822	1.718	1.607	1.489	1.364	1.230	1.087	-4.704
Difference in lease expense under proposals vs. IAS 17 operating lease		0	-2.907	-1.284	-1.207	-1.127	-1.042	-954	-862	-765	-663	-557	-446	-329	-207	-79	55	195	342	496	657	826	1.002	1.188	1.382	1.585	4.704
Control	0	Has to be 0																									

DESCRIPTION / CALCULATION DETAIL

Impacts & Differences IAS17 & IFRS16 - Future rents

	Initial	1999 to 2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Cash payments	0	0	4.123	4.251	4.357	4.479	4.479	4.493	4.669	4.826	4.873	4.858	4.866	4.892	4.946	5.001	5.056	5.111	5.167	5.224	5.282	5.340	5.399	5.458	5.518	5.579	0
Income statement:																											
Interest expense	0	0	4.123	2.628	2.658	2.699	2.615	2.540	2.624	2.684	2.630	2.509	2.405	2.315	2.247	2.173	2.094	2.010	1.919	1.822	1.718	1.607	1.489	1.364	1.230	1.087	-4.704
Amortisation expense	0	0	2.907	2.907	2.907	2.907	2.907	2.907	2.907	2.907	2.907	2.907	2.907	2.907	2.907	2.907	2.907	2.907	2.907	2.907	2.907	2.907	2.907	2.907	2.907	2.907	0
Total lease expense	**0**	**0**	**7.030**	**5.535**	**5.565**	**5.606**	**5.522**	**5.447**	**5.530**	**5.590**	**5.537**	**5.415**	**5.312**	**5.222**	**5.153**	**5.080**	**5.001**	**4.916**	**4.826**	**4.729**	**4.625**	**4.514**	**4.396**	**4.270**	**4.136**	**3.994**	**-4.704**
Balance sheet:																											
Right-of-use asset	69.760	69.760	66.853	63.946	61.040	58.133	55.226	52.320	49.413	46.506	43.600	40.693	37.786	34.880	31.973	29.067	26.160	23.253	20.347	17.440	14.533	11.627	8.720	5.813	2.907	0	0
Liability to make lease payments	-69.760	69.760	61.513	54.634	47.619	40.440	33.346	26.313	19.021	11.511	4.008	-3.359	-10.630	-17.837	-25.030	-32.204	-39.354	-46.474	-53.561	-60.607	-67.607	-74.554	-81.442	-88.263	-95.011	-101.677	0
IAS 17 Operating lease expense	**0**	**0**	**4.123**	**4.251**	**4.357**	**4.479**	**4.479**	**4.493**	**4.669**	**4.826**	**4.873**	**4.858**	**4.866**	**4.892**	**4.946**	**5.001**	**5.056**	**5.111**	**5.167**	**5.224**	**5.282**	**5.340**	**5.399**	**5.458**	**5.518**	**5.579**	**0**
Difference in lease expense under proposals vs. IAS 17 operating lease	0	0	2.907	1.284	1.207	1.127	1.042	954	862	765	663	557	446	329	207	79	-55	-195	-342	-496	-657	-826	-1.002	-1.188	-1.382	-1.585	-4.704
Control	0	Has to be 0																									

PV and Interest Calculation

	YEAR	1999 to 2005	2.006	2.007	2.008	2.009	2.010	2.011	2.012	2.013	2.014	2.015	2.016	2.017	2.018	2.019	2.020	2.021	2.022	2.023	2.024	2.025	2.026	2.027	2.028	2.029	2.030
Total value	118.246	118.246	114.123	109.872	105.515	101.036	96.556	92.064	87.395	82.569	77.696	72.838	67.972	63.079	58.133	53.133	48.077	42.966	37.799	32.574	27.293	21.953	16.554	11.097	5.579	0	0
Present Value	69.760																										
PV per year		0	69.760	68.137	66.438	64.658	62.794	60.841	58.796	56.654	54.411	52.062	49.601	47.023	44.324	41.497	38.535	35.434	32.185	28.783	25.219	21.487	17.578	13.484	9.195	4.704	0
Difference	48.486	48.486	44.363	41.735	39.077	36.378	33.763	31.222	28.599	25.915	23.285	20.776	18.371	16.056	13.809	11.636	9.542	7.532	5.613	3.792	2.073	466	-1.023	-2.387	-3.617	-4.704	0
Interest per year	48.486	0	4.123	2.628	2.658	2.699	2.615	2.540	2.624	2.684	2.630	2.509	2.405	2.315	2.247	2.173	2.094	2.010	1.919	1.822	1.718	1.607	1.489	1.364	1.230	1.087	-4.704
Control	0	Has to be 0																									

Auxiliary Calculations

Fixed rents	Initial	1999 to 2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Fixed rents			4.123	4.251	4.357	4.479	4.479	4.493	4.669	4.826	4.873	4.858	4.866	4.892	4.892	4.892	4.892	4.892	4.892	4.892	4.892	4.892	4.892	4.892	4.892	4.892	
Coefficient	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,01	1,01	1,01	1,01	1,01	1,01	1,01	1,01	1,01	1,01	1,01	1,01	1,01
Fixed Cash payments	0	0	4.123	4.251	4.357	4.479	4.479	4.493	4.669	4.826	4.873	4.858	4.866	4.892	4.946	5.001	5.056	5.111	5.167	5.224	5.282	5.340	5.399	5.458	5.518	5.579	0

Variable rents	Initial	1999 to 2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Production																											
Rate	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Variable Cash payments	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Rents	**0**	**0**	**4.123**	**4.251**	**4.357**	**4.479**	**4.479**	**4.493**	**4.669**	**4.826**	**4.873**	**4.858**	**4.866**	**4.892**	**4.946**	**5.001**	**5.056**	**5.111**	**5.167**	**5.224**	**5.282**	**5.340**	**5.399**	**5.458**	**5.518**	**5.579**	**0**

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